

SN 10/770,279

Page 2 of 11

IN THE CLAIMS:

Please amend the claims as follows:

1. (Currently Amended) An integrated polarization splitter having a passive portion and an active portion, comprising:
 - an arrayed waveguide grating (AWG) in the passive portion, the AWG including:
 - an input coupler;
 - an output coupler; and
 - a plurality of waveguides of unequal length connecting said input and output couplers;
 - wherein at least two output ports of said AWG are positioned relative to an input port such that a first polarization component and a second polarization component of a single channel input signal arriving at different phase fronts of a free space region at an output side of said AWG are respectively received by separate ones of said output ports such that said first polarization component and said second polarization component are split by said AWG; and
 - ~~wherein said polarization splitter is integrated using active/passive monolithic integration techniques such that said polarization splitter is adapted for being integrated with active devices and passive devices~~ the passive portion and the active portion are integrated in accordance with active/passive monolithic integration techniques, wherein the active portion comprises at least one active device for modifying at least one of said first polarization component and said second polarization component.
2. (original) The polarization splitter of claim 1, wherein said first polarization component comprises a TE mode and said second polarization component comprises a TM mode of said input signal.
3. (original) The polarization splitter of claim 1, wherein the polarization of input signals separated in wavelength from said single channel input signal by integer multiples of the free spectral range of said AWG is also split by said AWG.

SN 10/770,279

Page 3 of 11

4. (original) The polarization splitter of claim 1, wherein at least one of said output coupler and said input coupler comprises a star coupler.
5. (original) The polarization splitter of claim 1, wherein at least one of said output coupler and said input coupler comprises a slab waveguide lens.
6. (original) The polarization splitter of claim 1, wherein said polarization splitter performs at least one of wavelength multiplexing and demultiplexing for input signals comprising more than a single channel.
7. (original) The polarization splitter of claim 1, wherein said polarization splitter performs channel filtering.
8. (original) The polarization splitter of claim 1, wherein said polarization splitter is fabricated from optical waveguides, each of said optical waveguides comprising:
 - a shallow etched buried rib structure passive layer; and
 - a thin layer of multi-quantum-wells (MQW) on top of the buried rib structure functioning as an active layer.
9. (original) The polarization splitter of claim 1, wherein said polarization splitter further functions as a tunable polarization controller.
10. (Currently Amended) An integrated polarization splitter having a passive portion and an active portion, comprising:
 - an arrayed waveguide grating (AWG) in the passive portion, the AWG including:
 - at least one input means for receiving an input signal;
 - a means for coupling said input signal to said AWG;
 - a means for coupling an output signal from said AWG;
 - a plurality of waveguides of unequal length connecting said input coupling means and said output coupling means; and
 - at least two output means;

SN 10/770,279

Page 4 of 11

wherein said at least two output means of said AWG are positioned relative to said at least one input means such that a first polarization component and a second polarization component of said input signal arriving at different phase fronts of a free space region of said output coupling means of said AWG are respectively received by separate ones of said output means such that said first polarization component and said second polarization component are split by said AWG; and

~~wherein said polarization splitter is integrated using active/passive monolithic integration techniques such that said polarization splitter is adapted for being integrated with active devices and passive devices~~ the passive portion and the active portion are integrated in accordance with active/passive monolithic integration techniques, wherein the active portion comprises at least one active device for modifying at least one of said first polarization component and said second polarization component.

11. (original) The integrated polarization splitter of claim 10, wherein said input signal is a single channel input signal.

12. (original) The integrated polarization splitter of claim 10, wherein said first polarization component comprises a TE mode and said second polarization component comprises a TM mode of said input signal.

13. (original) The integrated polarization splitter of claim 10, wherein the polarization of input signals separated in wavelength from said input signal by integer multiples of the free spectral range of said AWG is also split by said AWG.

14. (Currently Amended) A method of fabricating a polarization splitter having a passive portion and an active portion, comprising:

~~integrating an arrayed waveguide grating~~ the passive portion and the active portion using an active/passive monolithic integration technique, wherein the passive portion comprises an arrayed waveguide grating, wherein at least two output ports of said AWG are positioned relative to an input port such that a first polarization component and a second polarization component of a single channel input signal

SN 10/770,279

Page 5 of 11

arriving at different phase fronts of a free space region at an output side of said AWG are respectively received by separate ones of said output ports such that said first polarization component and said second polarization component are split by said AWG, wherein said active portion comprises at least one active device for modifying at least one of said first polarization component and said second polarization component.